

27. (Currently Amended) The method of claim 26, wherein decoding includes applying an edge-sensitive post-filter, ~~the edge-sensitive post-filter including the capability~~ to enhance a decoded video frame based, at least in part, on a decoded edge detection map associated with the decoded frame.
28. (Original) The method of claim 27, and further comprising: storing the coded video image and edged detection map before decoding.
29. (Original) The method of claim 27, and further comprising: transmitting the coded video image and edge detection map via a bandwidth limited communications channel prior to decoding.

REMARKS

The above-referenced patent application has been reviewed in light of the Final Office Action, dated January 28th, 2003, and Advisory Action, dated April 14th, 2003, in which: Claims 1-4, 6, 7, 11-14, 16, 19-23, and 26 are rejected under 35 U.S.C. 102(e) as being anticipated by Go (U.S. Patent No. 5,878,172, hereinafter "Go"); claims 5, 15, 17, 24, 25 and 27 are rejected under 35 U.S.C. 103(a), as being unpatentable over Go, and further in view of Fan (U.S. Patent No. 5,359,676, hereinafter "Fan"); claim 8 is rejected under 35 U.S.C 103(a) as being unpatentable over Go as applied to claim 6 and further in view of Schreiber (U.S. Patent No. 3,035,121, hereinafter "Schreiber"); claims 9, 10, 18, 28 and 29 are rejected under 35 U.S.C 103(a) as being unpatentable over Go as applied to claims 4, 14, 16, 23 and 26 above, and further in view of well known prior art. Reconsideration of the above-referenced patent application in view of the following remarks is respectfully requested.

Claims 1 and 3-29 are now pending the above-referenced patent application. Claims 1, 5-10, 24-25 and 27 have been amended in order to clarify the claimed subject matter. No claims have been cancelled or added.

Applicants begin with claim 1. Claim 1, as amended, recites:

"A video processor system comprising:

a video coder, to generate an edge detection map along a predetermined direction for an uncoded frame that is to be coded, to code said uncoded frame, and to compress the edge detection map, wherein the edge detection map is compressed separately from the coded frame."

According to the Examiner, "[t]he claims do not positively recite the limitations argued. Go discloses the 'capability' to generate an edge detection map, the 'capability' to compress the edge detection map, and the 'capability' to compress the edge detection map separately from the frame that is to be coded. Applicant would need to change the scope of the claim by limiting the coder to positively include both functions or modes of operation, where one mode includes compressing an edge detection map and the other mode does not include compressing an edge detection map."

In consideration of the Examiner's rejection, and in the interest of expediency, Applicants have amended the claims in order to clarify the claimed subject matter. Elements of the claims are positively claimed, are adequately described in the specification, and, as set forth in the Manual of Patent Examining Procedure (MPEP), 8th ed., Aug 2001, § 2111, "During patent examination, the pending claims must be 'given the broadest reasonable interpretation consistent with the specification.'"

It is well-established that in order to establish a *prima facie* case of anticipation under 102 of the patent statute, the Examiner must provide prior art document that meets each and every element and limitation of the rejected claim. Therefore, even if a single element or limitation is not met by the asserted document, then the Examiner has not succeeded in establishing a *prima facie* case. It is respectfully asserted that Go does not meet at least one element of claim 1, as amended. As just an example, the video encoder disclosed in Go performs several additional and differing processing steps not required in claim 1, as amended. Go discloses a method of image encoding where the image is sent to an edge detector, and the image is additionally sent to both a filtering process and a down sampling process, resulting in coding and subsequent transmission being performed on representative filtered and down sampled data, rather than on the image. As stated in Column 2, lines 39-47 of Go, "The invented method of encoding a digitized image comprises the steps of: detecting edges in the digitized image; encoding the position and sharpness of the detected edges to generate edge image information; filtering and down-sampling the digitized image to generate a reduced image; and

encoding the reduced image to generate reduced image information." Additionally, in column 5, lines 61-67, "A digitized image X_0 is input from the input terminal 10 to the edge detector 21 and first smoothing filter 22-1. Smoothing filter 22-1 outputs a filtered image X_1 to the next smoothing filter 22-2, and this process continues, each smoothing filter 22-m filtering the image X_{m-1} received from the preceding smoothing filter and furnishing a new filtered image X_m to the next smoothing filter, until the last smoothing filter 22-n is reached. The last smoothing filter 22-n outputs a low-frequency image X_n to a down sampler 23, which outputs a reduced image R to the reduced image encoder 25. The reduced image encoder 25 encodes the reduced image R to obtain reduced image information Cr." Conversely, as illustrated in FIG. 1 of the present application, and as positively recited in claim 1, as amended, the frame is coded without performing these additional process steps and the frame is the object that is coded rather than the reduced image R as disclosed in the cited patent. There is no contemplation of requiring a filtering and down sampling process for the frame that is to be coded, and the frame itself is coded in the present application, rather than the reduced image information R, as disclosed in Go. The frame is not coded in Go, as claimed in claim 1. It is, therefore, respectfully asserted that the cited patent does not meet at least one element of claim 1, as amended.

It is, therefore, respectfully asserted that the Examiner has failed to provide prior art document that meets each and every element and limitation of claim 1, as amended. It is, therefore, respectfully asserted that claim 1, as amended, is in a condition for allowance. Claims 3 and 4 depend from and include all limitations of claim 1, and are, therefore, also in a condition for allowance.

Claim 6, as amended, is patentably distinct from Go for the same or similar reasons as claim 1. As just an example, Go performs coding and subsequent transmission on representative filtered and down sampled data, rather than on the image, or frame. Conversely, claim 6 is directed towards a video processing system to "code said uncoded frame", which is an element not disclosed in Go. Additionally, Applicants respectfully refer the Examiner to arguments made concerning the rejection of claim 1 above. It is, therefore, respectfully asserted that the Examiner has not established a *prima facie* case of anticipation under 102 of the patent statute for claim 6, as amended, and claim 6 is in a condition for allowance.

Claim 11 is patentably distinct from Go for reasons similar to those of claim 1. As just an example, the image, or frame, of Go is not coded, but, rather, a downsized representation of the image, or frame, is coded. The video processing system of Go does not disclose a method of frame processing where the video frame is not passed through a filtering and/or down sampling process. Applicant respectfully refers the Examiner to the arguments made in regard to claim 1 above. It is respectfully asserted that a *prima facie* case of anticipation under 102 of the patent statute has not been established for claim 11, and claim 11 is in a condition for allowance.

Claims 12-14, 16 and 19 either depend from or otherwise include all limitations of claim 11. It is, therefore, respectfully asserted that these claims distinguish from Go for at least the same reasons as claim 11, and are, therefore, in a condition for allowance.

Claim 20 is patentably distinct from Go for reasons similar to those of claim 1 and claim 11. As just an example, the video processing system of Go does not disclose a method of frame processing where the video frame is not passed through a filtering and/or down sampling process. Applicants respectfully refer the Examiner to arguments already presented in reference to claims 1 and 11 above. It is respectfully asserted that a *prima facie* case of anticipation under 102 of the patent statute has not been established for claim 20, and claim 20 is in a condition for allowance.

Claims 21-23 and 26 either depend from or otherwise include all limitations of claim 20. It is, therefore, respectfully asserted that these claims distinguish from Go for at least the same reasons as claim 20, and are, therefore, in a condition for allowance.

The Examiner has rejected claims 5, 15, 17, 24, 25 and 27 under 35 U.S.C. 103(a), as being unpatentable over Go, and further in view of Fan, claim 8 is rejected under 35 U.S.C 103(a) as being unpatentable over Go as applied to claim 6 and further in view of Schreiber, and claims 9, 10, 18, 28 and 29 are rejected under 35 U.S.C 103(a) as being unpatentable over Go as applied to claims 4, 14, 16, 23 and 26 above, and further in view of well known prior art. These rejections by the Examiner are respectfully traversed.

It is well established that in order to establish a *prima facie* case of obviousness, three basic criteria must be met. First, the Examiner must show a suggestion or motivation, either in the references

themselves or in knowledge generally available to one of ordinary skill in the art, to modify a prior art reference or combine two or more prior art references. Second, the Examiner must show a reasonable expectation of success in making this combination or modification. Third, the Examiner must show that the combination or modification, if proper, contains all of the elements of the application under examination. If any of these elements are not met, the Examiner has failed to establish a successful *prima facie* case of obviousness. It is respectfully asserted that the Examiner has failed to show that any combination of Fan and Go, or any modification of Go, or any combination of Go with well-known prior art or with the Schreiber patent contains all of the elements of the rejected claims. Using an example given in a previous response, the edge detection methods disclosed by Fan and Go, as compared to the claimed subject matter, are materially different. Go discloses a sum of differences approach, as stated on col. 6, line 66, to col. 7, line 23. This method disclosed by Go is applied to both the horizontal and vertical directions individually. Conversely, the detailed description of the present application, page 7, line 14 to page 8, line 15, discloses multiple methods for edge detection that may be used in accordance with the claimed subject matter, none of which employ the approach of Go.

Additionally, the video encoder disclosed in Go performs several additional and differing processing steps not required in the rejected claims. Go discloses a method of image encoding where the image is sent to an edge detector, and the image is additionally sent to both a filtering process and a down sampling process, resulting in coding and subsequent transmission being performed on representative filtered and down sampled data, rather than on the image. Conversely, as illustrated in FIG. 1 of the present application, the frame is coded without performing these additional process steps and the frame is the object that is coded rather than the reduced image R as disclosed in the cited patent. There is no contemplation of requiring a filtering and down sampling process for the frame that is to be coded, and the frame itself is coded in the present application, rather than the reduced image information R, as disclosed in Go. It is, therefore, respectfully that asserted that the Examiner has failed to establish a *prima facie* case of obviousness, specifically there is not showing that the combination or modification, if proper, contains all of the elements of the rejected claims. At least one element, as stated herein, is missing from each of the alleged combinations.

Additionally, the methods disclosed for frame and edge information coding as disclosed in reference to the rejected claims are materially different than the method disclosed in the Go patent, and similarly there appears to be no mention of methods for frame and edge detection in the Fan patent, or the Schreiber patent, that are even analogous to at least one method disclosed in the present application. Even if the Fan patent did disclose an edge sensitive post filter that could be modified to operate with the method disclosed in Go, although applicants have serious doubts concerning the operability of this combination, there still would be several elements not met by the combination. As stated previously, Go discloses a method of edge detection and frame encoding wherein the method used for image decoding is dependent upon the detection and use of edge information in the encoding process. The process disclosed in Go essentially describes a method of decoding where several edge maps produced during the encoding process are passed through smoothing and down sampling filters, and are then passed through edge synthesizers to produce several partially reconstructed images of the edges of the original image passed through the encoder. These edge maps, along with the reduced image information, are then supplied to an inverse wavelet transform processor, where the images are added together to produce a decoded image. The image cannot be reconstructed without use of extensive edge information, and the image information transferred is reduced image information R, that provides inadequate image information to fully decode the image. Therefore, even if this method were combined with that disclosed by Fan, it still would be a fundamentally different use of edge information, and a materially different method of image decoding that requires the use of edge information rather than making it optional as in at least one embodiment of the claimed subject matter.

Finally, there is no contemplation in either Fan or Go to transmit image data and edge detection data separately, or to compress or code image data and edge detection data separately, as disclosed and claimed by Applicants. It is conceded by the Examiner that the combination of Fan and Go discloses a method of transmission where the image data and edge detection data is multiplexed prior to transmission. Quoting from Go, column 6, lines 9-14, "The multiplexer 26 combines the reduced image information Cr and edge image information Cs into an encoded image C, which is output to a

first input/output device 28 ...” Conversely, quoting from the present application, page 10, lines 6-12, “Although the invention is not limited in this respect, it is envisioned that an edge detection map may be transmitted as supplemental signal information corresponding to a coded video frame. Therefore, at the far or receiving end of the communications channel, depending on the capabilities of the decoder, this edge detection map may or may not be employed to enhance the decoded video frame, as described in more detail in the embodiment below. Likewise, in addition to transmitting one edge detection map, in alternative embodiments, multiple edge detection maps may be transmitted, as previously indicated.” As can be seen from these excerpts, there is no contemplation in the cited patents to compressing or transmitting edge image information separately from image information, and therefore, an element of the claimed subject matter is not present in the cited patents. The Examiner has cited the Schreiber patent for support concerning the transmission of edge information and image information separately. It is respectfully asserted that even if there was a successful combining of Go and Schreiber, although applicants doubt the ability to do so, there still would be elements of the rejected claims not met by the combination, as described in detail previously.

It is, therefore, respectfully asserted that the Examiner has failed to meet at least one prong of the three-prong test for obviousness, and has therefore failed to establish a prima facie case of obviousness under section 103 of the patent statute. It is, therefore, respectfully asserted that claims 5, 9-10, 15, 17-18, 24, 25 and 27-29 are in a condition for allowance.

CONCLUSION

In view of the foregoing, it is respectfully asserted that all claims pending in this application, as amended, are in condition for allowance. If the Examiner has any questions, he is invited to contact the undersigned at (503) 264-9427. Reconsideration of this patent application and early allowance of all the claims is respectfully requested.

Please charge any shortages and credit any overcharges of any fees required for this submission to Deposit Account number 02-2666.

Respectfully submitted,



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